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# The Power of Colour<sup>1</sup>

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## 1. Introduction

Would the world be lushly coloured, tasty and smelly as we experience it, if there were no one to perceive it? Are colours, tastes, smells, etc. features of the world, or features of our experience? Or neither? Or, intriguingly, both? The debate on the nature of perceptual content is as old as philosophical enquiry itself.<sup>2</sup> A large part of this debate has been focusing on colour perception in particular, and so we do here. To put it in stark terms, the divide is between those who hold that colours are exhaustively accounted for in terms of physical properties of objects: they are “out there in the world”, and they are the external causes of our experience of them; and those who claim that colours are “in the head”, and that without perceivers there would be no colours at all: we bestow colour on a (scientifically) colourless world. We label here for ease of reference the first view *Physicalism* and the second *Projectivism*. Various attempts have been made in the philosophical literature to do justice to the contrasting and yet compelling intuitions motivating these two views about colours; intuitively, colours seem to be out there *and also* “in the head”; also, it seems plausible to assume that the phenomenology of our experience is fundamentally correct, rather than systematically wrong. If the qualities of the objects in the world and the qualities of our experience of them were somehow connected, we could “save the phenomena”; but what sort of connection would this be?

Among recent discussions of these issues, there is David Chalmers’s (2006), which we take here as our starting point, for reasons we will explicate below. Chalmers considers the strengths (and shortfalls) of a view he calls *Primitivism*, according to which colours are primitive intrinsic properties instantiated by physical objects and *constitutively connected* to the phenomenal properties of our visual experience, but not identical with them<sup>3</sup>. Primitivism is an

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<sup>1</sup> Acknowledgements: This paper draws on ideas previously published by Marmodoro (2006) and Marmodoro (2014). We are grateful for the Editor’s helpful feedback on the penultimate draft of the paper.

<sup>2</sup> See for instance Ierodiakonou on ancient theories of colour (2005; forthcoming).

<sup>3</sup> For versions of Primitivism see Campbell (1993), Johnston (1992), McGinn (1996), Thau (2002), and Wright (2003). Not all Primitivists accept that primitive properties are instantiated. For instance, Holman (2002), Maund (1995) and Wright (2003) hold that they are un-instantiated, and hence colour experiences are illusory. In this paper, however, we focus on the ones who hold that primitive properties are instantiated, and hence colour experiences are veridical (Johnston, 1992; Campbell, 1993; McGinn, 1996).

appealing position: it does justice to the idea that objects are truly coloured, and colours are out there in the world, and connects somehow – constitutively – what there is in the world with what there is in our head. Yet, Primitivism posits, but doesn't account for, this all-important constitutive connection. That this is a shortfall of Primitivism is easily seen by considering some representative problematic cases. Firstly, an object may appear to the same perceiver to have different colours, even if it does not undergo any change in its properties: for instance, a lemon may appear to us yellow, or blue, even though there is no change in its properties, when we look at it under different light conditions. Secondly, colours may be experienced even in absence of a corresponding property in the world: for instance, in hallucinations. Thirdly, different perceivers may have different colour experiences of the same object (such as an experience of yellow and one of blue with respect to the same lemon) when seeing it under identical viewing conditions, if the perceivers are spectrum-inverted.<sup>4</sup> All these cases need to be accounted for and are at odds with Primitivism's claim that colours are primitive properties instantiated by physical objects.<sup>5</sup> Yet Primitivism is onto something that we reckon is the crux of the matter, that is: the connection between world and experience.

Following that lead, Marmodoro (2006) has put forward Constitutionalism, a metaphysical account of the connection between perceptual content and the qualities of objects in the world which draws on some key Aristotelian ideas. According to Constitutionalism objects do have qualitative features, such as colours and similar properties, but these properties “come to their full” only *when and while* the objects interact causally with perceivers, under certain conditions; furthermore, changes in the conditions wherein the interaction takes place bring about different “full” manifestations of the qualitative features of objects. Constitutionalism posits a relation of *co-manifestation* between the colour of the object and the phenomenal experience of the perceiver that sees the coloured object. This stance allows Constitutionalism to handle the cases that are problematic for Primitivism. Firstly, in doing so, Constitutionalism

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<sup>4</sup> Spectrum inversion is a hypothetical scenario in which the phenomenal experience connected to specific colours is swapped, but all their discriminatory power and their use of language are unchanged. It was first brought into the forefront of philosophical discussion by Locke, in his *Essay Concerning Human Understanding* (Book Two, Chapter 32, Section 15: “For all things that had the texture of a violet producing constantly the idea which he called blue, and those which had the texture of a marigold producing constantly the idea which he called yellow, whatever those appearances were in his mind, he would be able as regularly to distinguish things for his use by those appearances, and understand and signify those distinctions marked by the names ‘blue’ and ‘yellow’, as if the appearances or idea in his mind received from those two flowers were exactly the same with the ideas in other men’s minds” (Locke, 1689/1975).

<sup>5</sup> For an extensive discussion of the problems of Primitivism see Chalmers (2004).

avoids the problems shared by Primitivism and Physicalism. It accounts for how objects can indeed appear to have different colours without any change in their properties: it posits that colours are properties possessed by the object, but their manifestation is as dependent on the environment and on the properties of the perceiver as common sense suggests. Spectrum-inverted scenarios do not pose a problem for Constitutionalism because the same account applies: the inverted spectrum of the perceiver is part and parcel of the condition of manifestation of colours.

With respect to the individuation of powers, one can develop a spectrum of fine-tuned criteria. For example, the identity criteria of a book's power of weight to exert pressure may, or may not change, i.e. become a different power, each time the book is placed on a different surface. The dependence of the manifestation of the book's weight on the receiving surface's powers in each case may, or may not, be considered an essential criterion of the identity of the book's weight; that is, the book's weight may be a different power in diverse situations, or it may be the same power with diverse manifestations. And the same is true of the ability of a pianist to play the piano, or the power of a light to illuminate, and so forth. No matter where we place the cut-off line, we are being *pragmatic* about the identity criteria of a power. In Constitutionalism, the dependence of the manifestations of a power on different environments, where the power in potentiality is manifested, is not an essential criterion of the power's identity. It is an essential criterion only of the power's different manifestations. The pianist's power to play the piano does not change identities in each performance. (Music critics may, on the other hand, have much finer identity criteria of the pianist's power over time.) We will not explore in detail, here, how generic the identity-dependence of a power in potentiality can be on the conditions of its manifestation but only state that it is again a pragmatic consideration where to draw the line. Nevertheless, the role of the dependence on manifestation conditions as an identity criterion of the power in potentiality will come up in some of the discussions that follow.

We submit that Constitutionalism provides an account of colour perception that has clear advantages over Primitivism, to begin with, because it respects our intuitions and does justice to the phenomenology of our experience, and because it fares better than other alternative accounts in dealing with some familiar phenomena in perception. In this paper, we will explicate in some detail the metaphysics of powers that underpins Constitutionalism. We will here also contrast Constitutionalism with two alternative power-based accounts of colours,

proposed respectively by Heil (2003; 2012) and Kistler (2017); the discussion will allow us to show the advantages of Constitutionalism over them and thus provide further, albeit indirect, support for Constitutionalism. [Here](#) we will focus only on colour, but we hope this work will be foundational to a more comprehensive account that can be applied to all sensory modalities.

## 2. Constitutionalism and colour perception

Constitutionalism aims to provide an account of the qualitative natures of coloured surfaces *as properties of objects*, and in this respect, it is a realist account of colour properties. Constitutionalism also takes into account the role of the perceiver, and aims to account for cases such as non-veridical perception, hallucinations, and inverted-spectrum scenarios, which Primitivism does not explain. Key to this account is the concept of *sensuous properties*, which are the “qualitative character of the surface that according to Primitivism is revealed in a colour experience” (Marmodoro, 2006, p. 72)<sup>6</sup>. Things are sensuously coloured when their colour properties come to their full manifestation; the role of the perceiver is to enable the objects to reveal their colours in full, thus serving as a necessary condition for that “revelation” but without projecting colours onto the world.

Sensuous properties are *powers* of the objects, whose manifestations are dependent on external conditions, but also, crucially, “bound with” the manifestation of properties of the subjective experience of colours by a perceiver; such phenomenal properties too are powers. The fact that colours are powers is key to understanding the originality of power-based Constitutionalism: colours are real properties of objects; however, the *full* manifestation of the qualitative properties of objects is dependent on the environment *and* on the operation of the observer’s perceptual system. The thought in a nutshell is that, in perception: (i) there is a causal interaction between an object in the world and the perceiver’s perceptual system; (ii) this causal interaction (under appropriate circumstances, e.g. light conditions), grounds the co-occurrence of a specific phenomenal property in the perceiver (characterising the experience of seeing a specific colour) *and* the (full) qualitative character of the coloured surface. The phenomenal property in the perceiver and (full) qualitative character of the coloured surface are

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<sup>6</sup> According to Maund (2002): “It is plausible to go further and hold that colors are not only intrinsic features of physical bodies, but are presented as manifest, sensuous properties. The way they are manifest is that their nature is open and manifest, not hidden. [...] we can represent writers as diverse as Price, Thompson and Tye, despite their philosophical differences, as in agreement. There is a neutral sense of ‘sensuous’, or ‘phenomenal’, according to which it is possible for physical objects to have sensuous or phenomenal properties. Most importantly, the color properties that the natural concept of color attributes to physical objects are sensuous properties.” (Maund, 2002).

constitutively connected on account of their being mutually dependent for their occurrence – this provides the explanation of what Primitivism leaves unexplained.<sup>7</sup> In the next section, we will provide a more detailed account of the metaphysics of causation and causal powers that underpins Constitutionalism.

### 3. Power-based Constitutionalism

We will begin with a brief summary of the basic tenets of power metaphysics that are most relevant, by way of background, to Constitutionalism. The view that some or all fundamental properties in nature are powers is gaining consensus among contemporary metaphysicians. This view is in line with a historical metaphysical tradition as ancient as Western thought, and has numerous contemporary advocates (Shoemaker, 1980; Molnar, 2003; Mumford, 2004; Marmodoro, 2010; Heil, 2003; 2012). A core thesis common to all accounts of powers is that (i) powers are properties that are essentially directed towards their manifestation or exercise; for instance, the fragility of a glass is the property of the glass to be “directed” towards breaking, when struck, in appropriate conditions.<sup>8</sup> In addition to this core thesis, our account of powers is committed to two additional claims that not all power metaphysicians share: that (ii) a power’s manifestation always happens as mutual manifestation of partner-powers, which act reciprocally as necessary conditions for each other’s manifestation; and that (iii) the manifestation of a power is not a numerically different power from the power in potentiality: a power can exist unmanifested, and when it is manifestation, it is that very same power, but in a different state (i.e. it is the power exercised or activated). These three claims are significant to our account of colour perception: the fact that it is numerically one power that exists both manifested and unmanifested is key to understanding the originality of power-based Constitutionalism: colours are *sensuous* properties<sup>9</sup> (powers) of objects, but the (full) manifestation of such powers of the object depends on the mutual manifestation of the perceiver’s relevant powers and is co-realized with them in the interaction between object and

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<sup>7</sup> The mutual dependencies between phenomenal properties of our experience and the full qualitative character of objects are of co-determination, co-dependence, and co-variation, as discussed in Marmodoro (2006).

<sup>8</sup> However, the manifestation of a power is not necessary for the existence of a power: an object can possess a property even if the property is never manifested (e.g. a vase is fragile even if it never breaks).

<sup>9</sup> The reader should keep in mind that sensuous properties are not surface properties of objects. Contrary to surface properties, the interaction with a perceiver is necessary for the manifestation of sensuous properties, and, as explained by the multi-stage view of powers presented in detail below, their manifestation is a different stage of the numerically same power.

perceiver.<sup>10</sup> In addition to this, power-based Constitutionalism is committed to two further tenets: (iv) that some powers are *multi-track* and also (v) *multi-stage*. We explain and defend these ideas below.

### *Multi-track and multi-stage*

The theory we propose is in line with a reading of Aristotle according to which perceptible properties in general are multi-track<sup>11</sup> and multi-stage powers, i.e. powers that may have different manifestation types, each with multiple manifestation stages. Power-based Constitutionalism too takes colours to be multi-track and multi-stage powers.<sup>12</sup> This is a conception of powers that current metaphysics needs, but currently lacks. Let us see each concept in turn. The idea of multi-track powers is not as such new. In general, many power ontologists posit multi-track powers, namely they accept the idea that numerically one power may have manifestations of different types (called tracks).<sup>13</sup> A commonly referred to example of a multi-track power is the power of an electron to be affected by an electrostatic force  $F_1$  set at a distance  $D_1$  from the electric charge  $C_1$ , and to be affected by an electrostatic force  $F_2$  set at a distance  $D_2$  from the electric charge  $C_2$ . In this case, the electron's power is multi-track in the sense that the electron does not have as many numerically different powers to be affected by an electrostatic force as there are electrostatic forces, but only one numerically same power that admits different manifestation types, and is manifested in combination with different mutual manifestation partner-powers (i.e. the powers of the electrostatic force in question).

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<sup>10</sup> For clarity, sensuous properties are dependent on their co-manifestation partners, whether they are in potentiality or are manifesting. This does not entail that a tomato is red only if someone is seeing it, but only if someone can see it.

<sup>11</sup> For a detailed discussion of multi-track powers see Bird (2005; 2007).

<sup>12</sup> The former insight is not something the scholarly literature by and large attributes to Aristotle; various attempts have been made to interpret Aristotle's view of colours as involving only what we call single-track powers, namely powers that are picked out uniquely by a stimulus and a manifestation-type. For instance, Sarah Broadie (1993) interprets Aristotle's view of colours (as properties of surfaces) as causes "of only a single type of effect: the perception of them by animals" (Broadie, 1993, p. 146). An immediate problem with this view is that, if this is the case, nothing can mediate perception. For instance, the power of a surface to reflect light would not count as an effect of the surface being coloured, even though reflected light is the medium of perception. Allan Silverman (1989) too proposed a single-track reading of Aristotle's view, claiming that colour is "the capacity to cause a certain movement in the actually transparent [...] have the necessary property of being visible, not of being seen." (Silverman, 1989, p. 280). However, this view presents the converse problem: no real connection is established between the properties of objects and the perceptible qualities we experience.

<sup>13</sup> For further definitions of multi-track powers see Martin and Heil (1998; 1999), according to which the same power can manifest itself differently in conjunction with different disposition partners, and Choi and Fara (2016), for which they are "[...] conventional dispositions that correspond to more than one pair of stimulus condition and manifestation (Ryle 1949, pp. 43–45; Bird 2005, p. 367; Bird 2007, pp. 21–24; Ellis & Lierse 1994, p. 29). The thought is that exactly the same conventional dispositions may be picked out by multiple characterisations in terms of stimulus condition and manifestation." (Choi & Fara, 2016).

We, following Aristotle, combine this idea with that of powers' having also different *stages* of activation, with the second and fullest stage depending on the first.<sup>14</sup> We want to stress that being multi-stage is not the same and does not reduce to being multi-track. On the one hand, the multi-track allows for different manifestations and hence different *tracks* of a power, each one picking out numerically the same power. On the other hand, the multi-stage allows for a series of *stages* in the manifestation of a power, where any one of the stages in the series picks out the same track (of the same power). Multi-track *and* multi-stage powers are such that they may have different manifestation types, each with multiple manifestation stages. Thus the numerically same power can be possessed by an object but not manifested (e.g. the power of a bell to sound); it can be partially manifested (stage 1) in the absence of a perceiver (e.g. when a bell is rung but the sound is not heard by a perceiver); and it can be fully manifested (stage 2) in the presence of a perceiver P<sub>1</sub> (when the bell is rung and the sound is heard); furthermore, the numerically same power (but a different track of it) can be equally fully manifested in the presence of a perceiver P<sub>2</sub> with a slightly different auditory system than P<sub>1</sub>.<sup>15</sup>

Power-based Constitutionalism posits that colours possessed by objects are multi-track and multi-stage powers. Let us see in more details the specifics of this view. Consider the following scenario: a perceiver S sees a yellow lemon. The metaphysical analysis proposed by power-based Constitutionalism goes as follows. Genuine perception of colour always involves two causal factors: the perceived object, and the perceiver. On the perceiver's side, perception of colour is the manifestation of the perceiver's power Q to see colour,<sup>16</sup> triggered by the object's properties, namely the object's power to appear coloured in a certain way—yellow, for instance. On the object's side, being yellow is the manifestation of the power P (a sensuous property) to appear coloured in a certain way, triggered by the perceiver's relevant properties, namely the perceiver's power to see colour. The powers Q and P belong respectively to the perceiving subject and to the object of perception. Further, consider the stage-dimension of P: the power of the lemon to look yellow can be partly manifested even in the absence of a perceiver; this requires only the presence of light as manifestation condition. But this is only the first stage of manifestation of the lemon's power to look yellow. It is only when the power

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<sup>14</sup> For a discussion of Aristotle's view and a detailed account of multi-track and multi-stage powers see Ch. 3 of Marmodoro (2014).

<sup>15</sup> Hearing and sounding is one of Aristotle's examples in his treatise *On the Soul*.

<sup>16</sup> Or more analytically, the manifestation of the perceiver's visual system's powers to detect light, and the power of the perceiver to experience colour. Although we believe that an account of phenomenal experience in terms of powers of the perceiver can be formulated, for the sake of brevity we will not discuss it in this paper.



of the lemon to look yellow and the power of the perceiver to perceive yellow co-manifest, that the power of the lemon to look yellow is fully exercising and revealing itself. This is the second stage of manifestation of the lemon's power to look yellow.

Discussing the relationship between the power to produce sound and the power to hear, Aristotle claims:

“It is possible to have the capacity to hear and not to hear, and that which can produce sounds is not always doing so. But when that which can hear is hearing and that which can produce sound is producing it, then hearing in actuality and sounding in actuality come to be at the same time, and one might call the one hearing and the other sounding.”

(*De Anima* 425b28–426a1, our translation and emphasis).

*Mutatis mutandis*,<sup>17</sup> the power of the lemon to look coloured in a certain way admits different stages of manifestation: in the absence of (what Aristotle calls) the medium, i.e. light, the power is not manifested (this could be called stage 0 of the power's actuality); in the presence of light (i.e. appropriate conditions) but in the absence of a perceiver, the power to look yellow is manifested in its first actuality (stage 1); in the presence of a perceiver (i.e. when co-realized with a further mutual manifestation partner, which is the perceiver's power to see yellow), the lemon's power to look yellow is manifested in its second-actuality (stage 2), namely it is fully manifested. The stage-dimension of power manifestation is crucial because it guarantees that what we see is really the power of the object; hence it provides a realist account of colours *qua* properties of objects, and yet the causal interaction with the perceiver “makes a difference” to what there is in the world.

The multi-stage dimension, however, is complemented by the multi-track dimension: numerically one power may have different manifestation-types (or tracks). Let us first discuss an example of multi-track powers that do not involve the multi-stage dimension. The track-dimension pertains both to the lemon's power to reflect light (which is not the same power that is fully manifested in perception, albeit connected to it), and to the lemon's power to look coloured (a sensuous property, which is the focus of our enquiry). The lemon's power to reflect

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<sup>17</sup> The metaphysics underpinning Aristotle's example is relevant to the present argument, even the example concerns a different sensory modality. We do not investigate here difference between sense modalities.

yellow light, for instance, is only one of the possible tracks of the lemon's power to reflect light—more precisely, to reflect all light wavelengths but blue. We saw that the interaction of the lemon's surface properties with a specific type of light grounds as partial manifestation the power to reflect yellow light. The (numerically) same power of the lemon can give rise to different manifestation types (or tracks), with different manifestation conditions. For instance, when the lemon is illuminated with green light, the power of the lemon manifests itself differently, i.e. as the power to reflect green light, whereas when illuminated with red light, the power of the lemon manifests itself in another way, i.e. as the power to reflect red light; finally, when the lemon is illuminated with blue light, the power of the lemon manifests itself in yet another way, i.e. as the power to reflect no light (i.e. to absorb blue light).<sup>18</sup> (The example so far doesn't involve any perceiver.)

Different tracks, however, are also at play when two different perceivers observe the same coloured object at the same time: perceiver A's perception of the yellow of the lemon, let us call it yellow<sup>A</sup>, is the first manifestation track of the power of the lemon to look yellow, whereas perceiver B's perception of the yellow of the lemon, let us call it yellow<sup>B</sup>, is the second manifestation track of the (numerically) same power of the lemon to look yellow. These two different manifestation types need not bring us to conclude that the lemon has indeed two numerically different powers because two different perceivers perceive two different colours, but rather that numerically the same power—the power to look coloured—admits two different manifestation tracks.

#### **4. Strengths of Constitutionalism in contrast to other power-based accounts**

Other attempts to provide a power-based account of colour perception have been made in the recent literature. We will conclude this paper with an analysis of two of them which are particularly relevant here since they share various elements with our account: John Heil's (2003; 2012) theory of *powerful qualities*, and Max Kistler's (2017) account of colours and *appearances* (i.e. their subjective experience). These accounts both endorse a metaphysics of powers, but develop in opposite directions from each other: Heil's towards Physicalism, and Kistler's towards Projectivism. After discussing them in turn, we will conclude that power-based Physicalism and power-based Projectivism have problems that power-based

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<sup>18</sup> This example of course involves ideal conditions where the lemon surface absorbs all blue light and it is illuminated only with light of blue frequencies. A similar ideal case is the *black body*: a perfectly black object that absorbs all incident electromagnetic radiation. In real life, all objects reflect some light, and this is why black objects are visible, and a lemon under blue light looks grey instead of pitch black.

Constitutionalism does not; and a power-based account is not per se sufficient to explain colour perception unless metaphysically enriched in the ways we described above.

### *Heil's powerful qualities*

John Heil's theory of colour properties is explicitly underpinned by a Lockean view; it endorses Locke's distinction between *primary* and *secondary* qualities, and the idea that secondary qualities are powers of an object to produce ideas of certain sorts in the perceiving subject. Heil talks of the primary qualities as the fundamental properties of the objects, whereas secondary qualities are "[...] powers an object possesses in virtue of its possession of certain primary qualities [...] not properties objects possess alongside, or in addition to, their primary qualities." (Heil, 2003, p. 199). Heil takes colours to be properties of the latter kind. He explains: "to a first approximation, colours are dispositions of objects to produce experiences of distinctive sorts in observers." (Heil, 2003, p. 205). Heil argues that we must distinguish the colours objects have (i.e. their primary qualities) from their colour appearances (i.e. experienced colours of objects), and both from colour judgements (i.e. what colour objects are believed to have). But Heil leaves unfinished the hard task of explicating the relation between experience of colours and judgements. In 2003, Heil limits himself to pointing out which direction a solution should take: "we should do well to reject the idea, implicit in much philosophical writing on colour, that either (a) colour predicates uniquely designate properties of objects (or light radiation) or (b) colours are subjective, mind dependent. [...] What are colour experiences? How are colour experiences related to objects' colours? Does a commitment to colour experiences bring with it a commitment to non-material properties? These are the kinds of question a satisfactory ontology of colour ought to answer." (Heil, 2003, pp. 206-207). Heil however does not address in his work the question that he raises here. Heil is fully committed to the idea that qualities of experience "[...] need not, and typically will not, resemble qualities of things experienced". (Heil, 2003, p. 225). However, Heil's theory focuses only on the properties of the latter, which leaves the experience of colour completely unexplained. Moreover, in the case of colour, that leads to the conclusion that only colour sensation is coloured, but objects are not. Heil writes: "Colour experiences are mutual manifestations of structured light radiation and the visual systems of observers." (Heil, 2003, p. 205). However, the experiential nature of this particular kind of mutual manifestation remains unexplained, and, more importantly for our purposes here, so does the connection between the experience and the properties of the objects.

In later work (2012) he characterises secondary qualities as “[...] arrangements of the primaries. If you arrange the corpuscles in a particular way, the result is something red—something that looks red in virtue of reflecting light in a particular way” (Heil, 2012, p. 82). But when Heil elaborates this idea, he writes:

“A better way of thinking about the primary–secondary division aligns with the aforementioned distinction between genuine properties and properties in the relaxed sense, ‘properties by courtesy’, *quasi-properties* [...] what you get when you organize substances in the right way.” (Heil, 2012, p. 56).

One might ask, how are we to understand the idea of quasi-properties? Do they exist, or not? Are they an intermediate type of entity in the ontology? As pointed out by Carmichael (2013): “Are quasi-properties abstract, or can they have locations in space? Are there complex quasi-properties? What of the quasi-property of being in pain -- does it have any causal powers? I see no reason not to regard these questions as ontologically interesting, especially given that Heil admits (pp. 151-152) that quasi-properties may play a role in completed science. [...] I'm unconvinced -- and Heil offers no argument -- that these questions about non-fundamental matters are unimportant in ontology.” (Carmichael, 2013).

Heil's theory of powerful qualities bears on his view of colours, but it does not address the issue of the status of colours and suchlike quasi-properties in the world. The concept of powerful qualities (which Heil endorses following C. B. Martin)<sup>19</sup> may explain why primary qualities are of a qualitative nature (i.e. can be described as categorical properties) instead of dispositional properties, but it does not per se account for the difference between primary and secondary qualities. Since colours (as experienced by perceivers) are secondary qualities, in this view colours are dismissed as quasi-properties Heil does not provide a complete account of colour perception, and *a fortiori* does not explain how the experience of colour relates to the properties of objects.

By contrast, power-based Constitutionalism offers an account that takes realist intuitions about colours seriously, and provides a richer metaphysical account of perception. If colours are understood as multi-track and multi-stage powers, colours are both objective features of objects and perceptible qualities co-manifesting with their corresponding phenomenal experience. This view is a realist one inasmuch as it justifies the phenomenological datum that colours are “out

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<sup>19</sup> For the first formulations of powerful qualities see Martin & Heil (1998; 1999).

there in the world” as properties of objects, and also ties their manifestation *qua* qualitative feature of objects to the manifestation of phenomenal experience in the perceiver. In Heil’s view secondary properties are *quasi*-properties; for power-based Constitutionalism, to the contrary, colours are not properties by courtesy, but *real* properties of objects. Moreover, power-based Constitutionalism provides a metaphysical explanation of the process of colour perception: of why and how the qualitative nature of object surfaces and the phenomenal experience of colours are co-determined, co-dependent, and co-vary, namely, why and how they are co-realized by the interaction between the object and the perceiver, and how they reach their full manifestation (the second stage). Hence, we submit, it is a preferable account to Heil’s.

### *Kistler’s multi-track view of colour*

A second view, recently proposed by Kistler (2017), is particularly relevant here because it puts to use power metaphysics, and in particular multi-track powers. According to Kistler, colour is an objective property of the surfaces of objects, and is a multi-track power: “Colors are what have traditionally been called ‘multi-track’ dispositions. [...] For each context of observation of a given colored surface, the color grounds a disposition to appear to a given observer.” (Kistler, 2017, p. 179).<sup>20</sup> The key point in Kistler’s account is that the perceiver’s properties or perceptual powers “[...] do not determine the objective color of perceived objects, but they *contribute* to determining how the color appears to the subject” (*ibid.*).<sup>21</sup> Such appearances are manifestations of the “objective powerful colour property.” (*ibid.*).<sup>22</sup> Kistler calls such appearances “looks”: looks are “aspects of perceptual experience that are directly accessible to the subject and perfectly known to her (i.e. known completely and infallibly).” (Kistler, 2017, p. 181). “There is nothing more about the look of A than how S judges it to be at a given moment” (Kistler, 2017, p. 192)<sup>23</sup>.

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<sup>20</sup> In Kistler’s words: “[...] the concept of disposition is useful in making explicit the relation between the power and its manifestations, especially with respect to those manifestations that are only possible but not actual. To each possible manifestation that the power gives objects possessing it, corresponds one actual disposition. Instead of saying that the power can manifest (i.e. does possibly manifest itself) in different ways, the use of the concept of disposition makes it possible to say that objects that have the power (powerful property) actually have a whole range of dispositions to manifest.” (Kistler, Colors and Appearances as Powers and Manifestations, 2017, p. 179).

<sup>21</sup> Through an act of comparison, see *infra*.

<sup>22</sup> For a detailed presentation of Kistler’s view of powerful qualities (and its differences from the one developed by Heil) see Kistler (2006).

<sup>23</sup> Kistler’s reference to appearances is somewhat ambiguous: at times, he claims that appearances are *constituted* by acts of comparison, but also that they are manifestations of the objective powerful colour property. In our understanding, this means that appearances are the result of an act of comparison, and they are manifestations of powers.

Let us see in more detail the metaphysical background of this view. According to Kistler, colours (as objective properties of the surfaces of objects) are multi-track powers; for each context of observation of a given coloured surface, the colour grounds a disposition to appear to a given observer. Further, the colour appearance of an object is a manifestation that is specific to the power, the observer, and the context (appearances are the product of acts of comparison, i.e. judgements).

We disagree with Kistler's proposal and believe power-based Constitutionalism provides a better account of colour perception. Kistler's account fails to address the problems faced by Projectivism. His view does not provide an account of the objectivity of colours; to the contrary, colours are reduced to judgements made by the subject in particular acts of comparison. From the fact that perceived colours are acts of comparison follows that different acts of comparison will result in different perceived colours, and there seems to be no explanation for the persistence of our experience of colour across comparisons. In Kistler's words:

“I have taken looks to be defined by the possibility for the subject to know them immediately, exhaustively, and infallibly. I have suggested that this is possible if colors and other objective properties that are objects of perceptual judgments, are ‘multi-track’ powers. Each occasion of comparison between two perceptible items is a triggering condition, relative to which the power gives rise to a disposition to appear in a certain way to a given type of cognitive subject.” (Kistler, *Colors and Appearances as Powers and Manifestations*, 2017, p. 193).

Moreover, in Kistler's account, colour perception *qua* manifestation of a look, is only connected with the properties of the object via a triggering condition, i.e. the “occasion of comparison”, but the metaphysical connection between the two is left unexplained: no explanation is provided of what determines the manifestation of a specific track of the multi-track power of the object in conjunction with a specific look, deriving from a specific act of comparison.

To summarise, our understanding of Kistler's view is the following: colours are objective, because they are multi-track powers of object surfaces that ground various dispositions. However, colour perception involves a “subjective” part, which is a “look”, not a colour. The look contributes to the manifestation of a particular track or disposition, but ultimately is

nothing more than the result of a judgement, an act of comparison. So, colours are objective properties of things in the world, powers that ground multiple dispositions, each of which has a manifestation that is “composed” (as if it had parts) by an objective and a subjective component. If this is the correct understanding of Kistler, we argue that his view is highly mysterious. Firstly, the appeal to the notion of “composition” to characterize the manifestation of colour properties is obscure; should this be understood in mereological terms, the resulting picture is puzzling: colour perception *qua* manifestation of a look is connected with the properties of the object via a triggering condition, i.e. the “occasion of comparison”, but it is also (mysteriously) connected by contributing a “part” to the manifestation of a disposition that is grounded in an objective power of the object. But how should one understand precisely the notion of “parts” of a manifestation? Secondly, what is the nature of a manifestation that is partly mental and partly physical? The manifestation is, on this view, a “hybrid” of categorically different beings: the mental and the physical.

Power-based Constitutionalism offers a richer account that, via the apparatus of multi-track and multi-stage powers and the appeal to the existence of mutual dependencies between the phenomenal properties of experience and the qualitative character of object (which allow for their occurrence, and are further explained in Marmodoro 2006), does not leave any of them unexplained. Finally, power-based Constitutionalism claims that, since colours are multi-track and multi-stage powers, and sensuous properties and phenomenal experience of colour are co-realized, different experiences derive from different acts of comparisons; and different manifestations are due to the different tracks of the powers involved and to the difference in the manifestation of sensuous properties belonging to the object. There is thus no need to resort to any “hybrid” of categorically different beings.

## **5. Conclusions**

Is colour in the world or in our heads? What makes the world coloured, tasty and smelly as we experience it? Moreover, most importantly, how do the properties of the world relate to the properties of the perceivers’ experiences? According to Constitutionalism, the world is indeed colourful, and our experience of it brings its colours to their full manifestations. It does so because colours are both objective features of objects and perceptible qualities co-manifesting themselves with their corresponding phenomenal experiences. Power-based Constitutionalism adds Power ontology to this picture, and results in a view for which the powers of the object and of the perceiver are constitutionally connected via a relation of co-

realization. Colours are powers of objects whose (full) manifestation depends on the mutual manifestation of relevant powers of the perceiver and is co-realized with them in their interaction. In addition, power-based Constitutionalism takes colours to be *multi-track* and also *multi-stage* powers. The track-dimension explains why the numerically same property of an object can have different types of manifestation (for instance, appear as different colours to different perceivers). The stage-dimension guarantees that colours are real, objective powers of the object, and hence provides a realist account of colours *qua* properties of objects; but also, it explains the crucial role of the perceiver, as the causal interaction with the perceiver “makes a difference” to what there is in the world, and brings it to its full manifestation. Power-based constitutionalism does justice to our intuitions about both the objective and subjective features of colour: it does justice to the phenomenology of our experience, and simultaneously binds it to the objective features of physical objects—all this, supported by a metaphysical framework that explains the ontological underpinnings of the power of colour.

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